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CAAGAAATAGTAATGGAAAATGTGACAGAAGAGTTCAACATGTGGAAAAATAACATGGTAGAACAGATGCATGAGGATAT
AATCAGTTTATGGGATGAAAGCCTAAAGCCATGTGTAAAATTAACTCCACTCTGTGTTACTCTAAATTGCACTACTGAGT
TGAATCTTCTAAATTGCATTGATAATAGTACTAATGATAAATGTATACCGCCAGATCAAAAAGGAGAAATGAAAAACTGC
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TCCACATACCTAGAAGAATAAGACAGGGCTTTGAAAGGGCTTTGCTATAA

FIG. 1

ATGAGAGTGAAGGGGATCAGGAAGAATTATCAGCACTTGTGGAGATGGGGCACCATACTCCTTGGGATGTTGATGATCTG
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CATCAGATGCTAAAGCATATAGTACAGAGGTACATAATATTTGGGCCACACATGCCTGTGTACCCACAGACCCCAGCCCA
CAAGAAATAGTAATGGAAAATGTGACAGAAGAGTTCAACATGTGGAAAAATAACATGGTAGAACAGATGCATGAGGATAT
AATCAGTTTATGGGATGAAAGCCTAAAGCCATGTGTAAAATTAACTCCACTCTGTGTTACTCTAAATTGCACTACTGAGT
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AATAGATCTCTGGGAGACATTTGGGAAAATGATAACATGACCTGGATGAAGTGGGAAAGAGAAATTGATAATTACACAAG
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GGTTTAAAAATAGTTTTTAGTGTGCTTTCTATAGTGAATAGAGTTAGGCAGGGATACTCACCATTGTCGTTTCAGACCCG
GCCCCCAGCCCCGAGGGGACCCGACAGGCCCGAAGGAATCGAAGAAGAAGGTGGAGAGAGAGACAGATCCGGCA
GATTAGTGGATGGATTCTTAGCACTTATCTGGGTCGACCTGCGGAGCCTGTGCCTCTTCAGCTACCACCGCTTGAGAGAC
TTACTCTTGATTGCAGCGAGGATTGTGGAACTCCTGGGACGCAGGGGGTGGgAAGTCCTCAAGTATTGTTGGAATCTCCT
ACAGTACTGGAGTCAGGAACTAAAGAATAGTGCTGTTAGCTTGCTTAATACCATAGCAATAGCAGTAGCTGAGGGGACAG
ATAGGGTTATAGAAATAATACAAAGAGCTTGTAGAGCTATTCTCCACATACCTAGAAGAATAAGACAGGGCTTTGAAAGG
GCTTTGCTATAA

FIG. 2

atgagagtgaaggagaaatatcagcacttgtggagatgggggtggagatggggcaccatgctccttgggatgttgatgat
ctgtagtgctacagaaaaattgtgggtcacagtctattatggggtacctgtgtggaaggaagcaaccaccactctatttt
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ttttgctataa

FIG. 3

Robert Gebhardt

```
                1                                                   50
HXB2            MRVK...EKY QHLWRWGWRW GTMLLGMLMI CSATEKLWVT VYYGVPVWKE
WEAU1.6         ----GIRKN- ---....-K- .IM---I--- ---AEN---- ----------
AD3.V6          ----GIRRN- ---....-R- GTM---M--- ---ADQ---- ----------
AD3.V22         ----GIRKN- ---....-R- GTI---M--- ---ADQ---- ----------

                51                                                  100
HXB2            ATTTLFCASD AKAYDTEVHN VWATHACVPT DPNPQEVVLV NVTENFNMWK
WEAU1.6         ---------- ----D----- V--------- --N---V-LE ----N-----
AD3.V6          ---------- ----S----- I--------- --S---I-ME ----E-----
AD3.V22         ---------- ----S----- I--------- --S---I-ME ----E-----

                101                                  V1             150
HXB2            NDMVEQMHED IISLWDQSLK PCVKLTPLCV SLKCT..... .........
WEAU1.6         -N-------- ------Q--- ---------- T-N--N.... .......VNV
AD3.V6          -N-------- ------E--- ---------- T-N--TELNL LNCID.....
AD3.V22         -N-------- ------E--- ---------- T-N--TELNL LNCIDNSTSG

                151  V1                                  V2             200
HXB2            .DLKNDTNTN SSSGRMIM.. EKGEIKNCSF NISTSIRGKV QKEYAFFYKL
WEAU1.6         TNLKNETNT- -SSGGEKM.. EE-EM----- -VTTL--N-R KT---L--KL
AD3.V6          .........- -TNDKCIPPD QK-EM----- -ITAG--N-V RK---L--TS
AD3.V22         NNTDNSTSS- -TDDKCIPPD QK-KM----- -ITAG--D-V RK---L--TS
```

Fig. 4A

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          201  V2  .<----------.                                        250
HXB2      DIIPID..ND TTSYKLTSCN TSVITQACPK VSFEPIPIHY CAPAGFAILK
WEAU1.6   -VM---..R- NT--T-IN-K S-T------- ---------- ----------
AD3.V6    -VA---..N- TI--R-IS-N T-I------- ---------- ----------
AD3.V22   -VA---..N- KI--R-IS-N T-I------- ---------- ----------

          251                                                       300
HXB2      CNNKTFNGTG PCTNVSTVQC THGIRPVVST QLLLNGSLAE EEVVIRSVNF
WEAU1.6   -NDKK---K- P-K------- ---------- ---------E EDI----E--
AD3.V6    -KDRN---T- L-K------- ---------- ---------E K-I----E--
AD3.V22   -KDRN---T- L-K------- ---------- ---------K K-I----E--

          301                                                  V3   350
HXB2      TDNAKTIIVQ LNTSVEINCT RPNNNTRKRI RIQRGRSRA. FVTIGK.IGN
WEAU1.6   -----N---- -NVSLE---- -----T--KI TL..----VL YTTGEI.--D
AD3.V6    -----T---- -PEIVH---- -----I--GL RI..----AW WYATRGI--K
AD3.V22   -----T---- -PEIVH---- -----I--GL RI..----AW WYATRGI--K

          V3                                                        400
          351 <-----
HXB2      MRQAHCNISR AKWNNTLKQI ASKLREQFG. .NNKTIIFKQ SSGGDFEIVT
WEAU1.6   I-RA---L-- TS-----K-- VE--REIKQF .K----V-K- --------VM
AD3.V6    M-QT---I-- VK-----E-- VK--GDKFGT NN----I-N- --------TM
AD3.V22   M-QT---I-- EK-----E-- VK--GDKFGT NN----I-N- --------TM
```

Fig. 4B

TOSEET 20SU1001

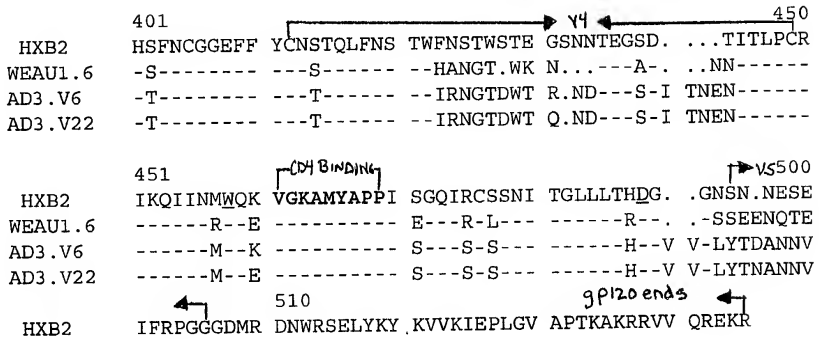


Fig. 4C

atgagagtgaaggggatcaggaagaattatcagcacttgtggagatggggcaccatgctccttgggatattaatgatctg
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agtgttacaaagagcttgtagagctattctccacatacctgtaagaataagacagggcttggaaagggctttgctataa

FIG. 5

```
            1                                                                                80

HXB2        MRVK...EKY QHLWRWG... .WRWGTMLLG MLMICSATEK LWVTVYYGVP VWKEATTTLF CASDAKAYDT EVHNVWATHA
92UG046-T8  -----IERN- ----ERNQHS LWR--I---- -----KG..E ---------- ---------- ------S-EP -A--I-----
93UG086-T8  -----IQRNC -N---..... ...---II-- -MI----A-- ---------- ---D-E---- ---------- ----------
92US077-T8  -----I-KN- ------S... ....TML--- ---------Q ---------- -----N---- ---------- -A--------
93US143-T8  -----IMKN- --F----... ....------ L------ADQ ---------- ----T----- ---------K --------M-
96USHIPS4-T8-----I-NNW -------... ....TML-.- ---------Q ---------- --R------- ----S----- -A--------
96USHIPS9-T8----EIMKN- --W--G-... .....I---- L------A-Q ---------- ---------- ---------- -K--------
96USSN20-T8 -----TQKS- PL---..... ...--.IIFW IMV--N-.-N ---------- --RD-E---- ---------- ----------
AD3.V6      ----GIRRN- ---..... .--------- -------ADQ ---------- ---------- --------S- ----I-----

            81                                                                               160
                                                                                  V1
HXB2        CVPTDPNPQE VVLVNVTENF NMWKNDMVEQ MHEDIISLWD QSLKPCVKLT PLCVSLKCTD .LKNDTNTNS SSGRMIME..
92UG046-T8  --------R- IK-E------ ---------- ----V----- ---------- ----T-H--E .Y-APNA-IN ATD-D-....
93UG086-T8  ---------- IN-E------ -----N---- --T------- -------Q-- ----T-D-.. .......-DA TNATNTTIIS
92US077-T8  ---------- I--A----D- -----N---- ---------- ---------- ----T-N--- .VR-G-IVRN -TI-VEEGM.
93US143-T8  ----F----. I..-...--- --L--N---- D--------- ------T--- ----T-N--- DLR-A---TT NTNSN.W-KP
96USHIPS4-T8---------- -L-E------ ---------- ---------- ---------- -R--T----- .Y.EGNAN-T IDNATKNSW.
96SUHIPS9-T8---------- ---E------ -----N---- ---------- ---------- ----T-N-.. ..R-V-I--T TTNSSGW.KL
96USSN20-T8 ---------- IP-E------ -----N---- -------D-- ---------- ----T-N--H NFN-FNSS-N -TPINNTIYN
AD3.V6      ------D--- I-ME----E- -----N---- ---------- E--------- ----T-N--T ELNLLNCIDN -TNDKCIPPD

            161                                                                              240
                  V2
HXB2        ..KGEIKNCS FNISTSIRGK VQKEYAFFYK LDIIPIDNDT ......... .TSYKLTSCN TSVITQACPK VSFEPIPIHY
92UG046-T8  ....GM---- --VT-EVIN- KKQ-H-L--- --VVQM-DNS TN........ .-N-R-IN-- ---------- -T--------
93UG086-T8  DM-------- --MT-ELKD- T--VRS---- M--VQ-N--N NSNSNSSQ.. ...-R-I--- ---------- ----------
92US077-T8  ..-E------ --VT--M-D- L---D----- S-V---G--N NTNTSNNNIT Y---P-R--- ---------- IN--------
93US143-T8  ME-------- -K-TG---D- ---Q--L--S --VV--K-NN NISNK..... .IR-R-R--- ---------- -T--------
96USHIPS4-T8..-------T --VT-A--D- -K-Q--L-HS --VV--KDAK DSN..... ..--R-I--- ---------- T-------Y-
96USHIPS9-T8MEE------- -K-T-IL-H- M-E-H-L- - S-VV-LG--NS AIGNNN.... .AR-K I -- - T------- - -.------
96USSN20-T8 GMQ------- --TT-EL--- TK-Q--L-N- --VVQ-NDKN NSHSNNRR.. ...-M-IH-- ---------- -T--------
AD3.V6      .Q---M---- ---TAG--N- -R----L--T S-VA------ ......... .I--R-I--- ---------- ----------
```

Figure 6A

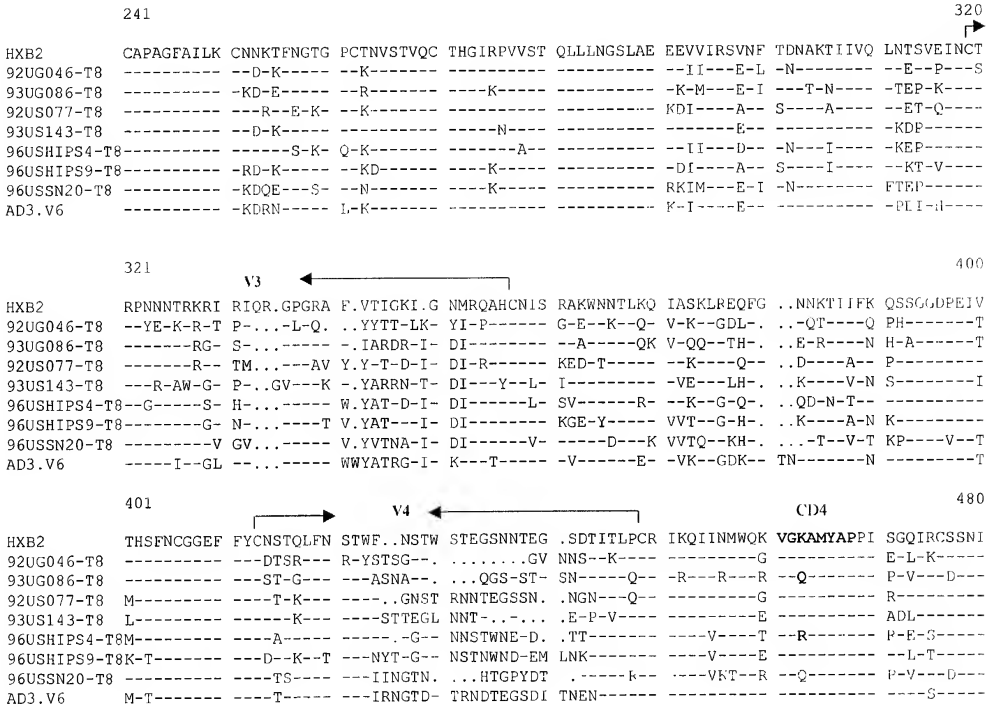
241
320
HXB2 CAPAGFAILK CNNKTFNGTG PCTNVSTVQC THGIRPVVST QLLLNGSLAE EEVVIRSVNF TDNAKTIIVQ LNTSVEINCT
92UG046-T8 ---------- --D-K----- --K------- ---------- ---------- --II---E-L -N-------- --E--P---S
93UG086-T8 ---------- -KD-E----- --R------- ----K----- ---------- -K-M---E-I ---T-N---- -TEP-K----
92US077-T8 ---------- ---R--E-K- --K------- ---------- ---------- KDI----A-- S----A---- --ET-Q----
93US143-T8 ---------- --D-K----- ---------- -----N---- ---------- -------E-- ---------- -KDP------
96USHIPS4-T8---------- ------S-K- Q-K------- -------A-- ---------- --II---D-- -N---I---- -KEP------
96USHIPS9-T8---------- -RD-K----- --KD------ ----K----- ---------- -DI----A-- S----I---- --KT-V----
96USSN20-T8 ---------- -KDQE---S- --N------- ----K----- ---------- RKIM---E-I -N-------- FTEP------
AD3.V6 ---------- -KDRN----- L-K------- ---------- ---------- K-I----E-- ---------- -PLI-N----
321
400
V3
HXB2 RPNNNTRKRI RIQR.GPGRA F.VTIGKI.G NMRQAHCNIS RAKWNNTLKQ IASKLREQFG ..NNKTIIFK QSSGGDPEIV
92UG046-T8 --YE-K-R-T P-...-L-Q. ..YYTT-LK- YI-P------ G-E--K--Q- V-K--GDL-. ...-QT----Q PH-------T
93UG086-T8 -------RG- S-...----- -.IARDR-I- DI-------- --A-----QK V-QQ--TH-. ..E-R----N H-A------T
92US077-T8 -------R-- TM...---AV Y.Y-T-D-I- DI-R------ KED-T----- --K----Q-- ..D----A-- P---------
93US143-T8 ---R-AW-G- P-..GV---K -.YARRN-T- DI---Y--L- I---------- -VE---LH-. ..K----V-N S---------I
96USHIPS4-T8--G-----S- H-...----- W.YAT-D-I- DI------L- SV------R- --K--G-Q-. ..QD-N-T-- ----------
96USHIPS9-T8--------G- N-...----T V.YAT---I- DI-------- KGE-Y----- VVT--G-H-. ..K----A-N K---------
96USSN20-T8 ---------V GV...----- V.YVTNA-I- DI------V- -----D---K VVTQ--KH-. ...-T--V-T KP----V--T
AD3.V6 -----I--GL --...----- WWYATRG-I- K---T----- -V------E- -VK--GDK-- TN-------N ---------T
401
480
V4
CD4
HXB2 THSFNCGGEF FYCNSTQLFN STWF..NSTW STEGSNNTEG .SDTITLPCR IKQIINMWQK VGKAMYAPPI SGQIRCSSNI
92UG046-T8 ---------- ---DTSR--- R-YSTSG--. ........GV NNS--K---- --------G ---------- E-L-K-----
93UG086-T8 ---------- ---ST-G--- ---ASNA--. ...QGS-ST- SN-----Q-- -R---R---R --Q------- P-V---D---
92US077-T8 M--------- ----T-K--- ----..GNST RNNTEGSSN. .NGN---Q-- ---------G ---------- R---------
93US143-T8 L--------- ------K--- ----STTEGL NNT-..-... .E-P-V---- ---------E ---------- ADL-------
96USHIPS4-T8M--------- ----A----- -----.-G-- NNSTWNE-D. .TT------- ----V----T --R------- P-E-S-----
96USHIPS9-T8K-T------- ---D--K--T ---NYT-G-- NSTNWND-EM LNK------- ----V----E ---------- --L-T-----
96USSN20-T8 ---------- ----TS---- ---IINGTN. ...HTGPYDT .-----K-- ----VKT--R --Q------- P-V---D---
AD3.V6 M-T------- ----T----- ---IRNGTD- TRNDTEGSDI TNEN------ ---------- ---------- ----S-----

Figure 6B

```
                481                                                                                                  535
                    ┌──────►  V5  ◄──┐                                                                  gp120 ends◄──┐
HXB2            TGLLLTRDGG NSNN..ESEI .FRPGGGDMR DNWRSELYKY KVVKIEPLGV APTKAKRRVV QREKRAVG.I GALFLGFLGA
92UG046-T8      ---------- ...-NTRQNE A--------- ---------- ---R-----L ---E------ E-----I-.L --M-------
93UG086-T8      ---I------ D...NNSTNE T--------- ---------- ---------- ---R------ E-----IAG- --V-------
92US077-T8      ---------- -T-DTNNT-- .--------- ---------- ---------I ---------- ------M-.- ----------
93US143-T8      ---------- VDE-SNTT-T .------N-- ---------- -A-------- ---------- --------.- --V-------
96USHIPS4-T8    ---------- -I-ETNGT-- .---A----- ---------- ---------I ---------- --------.V --M-----S-
96USHIPS9-T8    ---------- ..S-TNTT-V .------N-K ---------- ---------- ---------- --------.- ----------
96USSN20-T8     --I------- K...INSTNE T--------- ---------- ---------- ---H------ E-------V- --V-------
AD3.V6          ------H--V VGLYTDANNV T------N-- ---------- --I-V--I-I ---------- --------.- --M------T


HXB2            AGSTMGAASM TLTVQARQLL SGIVQQQNNL LRAIEAQQHL LQTLVWGIKQ LQARILAVER YLKDQQLLGI WGCSGKLICT
92UG046-T8      ---------- ---------M ---------- ---------- ---------- ---------S ---------- -----RH---
93UG086-T8      ---------L -----T---- --------S-- ---------- -K-------- ----V----- ---------- ----------
92US077-T8      ---------- ---------- ---------- --------H-- ---------- ----V----- ---------- ----------
93US143-T8      ---------I ---------- ---------- ---------- ---------- ----V----- ---------F ----------
96USHIPS4-T8    ---------V ---------- ---------- --------H- ---------- ----V----- --G------- ----------
96USHIPS9-T8    ---------L -----T---- ---------- ---------- ---------- ----V----- ---------- ----------
96USSN20-T8     --------AI ---------- -------S-- ---------- -K-------- ----V--L-- --R------- ----------
AD3.V6          ---A-----V ---------- ---------- ---------M ---------- ----V----- --R------- ----------


HXB2            TAVPWNASWS NKSLEQIW.. NHTTWMEWDR EINNYTSLIH SLIEESQNQQ EKNEQELLEL DKWASLWNWF NITNWLWYIK
92UG046-T8      ------S--- ----NE--.. GNM-----EK --D---E--Y -------T-- --------K- -Q-------- S--K------
93UG086-T8      -T----S--- ---YSE--.. DNM--LQ--K --S---QI-Y D--------- -----D--A- ----N----- D-SK-----R
92US077-T8      ---------- ----DK--.. -NM---Q-E- --D------Y T--------- ----L----- ----N----- D--K------
93US143-T8      ---------- ----DR--.. -NM-----E- --D---G--Y N--------- --------A- ---------- D---------
96USHIPS4-T8-T--T---- ---KY--.. DNM---Q--K --S---G--Y T--------- ----K----- ---------- D---------
96USHIPS9-T8-T-------- ----DD--.. QNM-----E- --D---NV-Y N--------- -----D--A- -------D-- S-S-------
96USSN20-T8 -N----S--- --TFND--.. .NM--LQ--K ------NT-Y R--------- -----D--A- -------S-- DLS------R
AD3.V6          ------S--- -R--GD--EN DNM---K-E- --D----Y-Y T--------- ----L----- ---D---S-- S---------
```

Figure 6C

```
HXB2         LFIMIVGGLV GLRIVFAVLS IVNRVRQGYS PLSFQTHLPT PRGPDRPEGI EEEGGERDRD RSIRLVNGSL ALIWDDLRSL
92UG046-T8   I--------I ---------- V--------- ------L--A ---------- -----QG-G ------T-FS --------N-
93UG086-T8   I--------I --------I- VI-------- ------LA-N -G-L---GR- -----Q--S ------S-F- --A-E-----
92US077-T8   I--------I ------VI-- ---------- ------R--A Q---------- -----G-G-- T-GP--D-F- -I--V-----
93US143-T8   I--------I ------T--- ---------- -------H-A Q-E------- -G-------- --GP--D-F- -I--V-----
96USHIPS4-T8 I--I-----I ------T--- ---------- ------R--- Q---------- ---------- --RTS-D-F- ----V-----
96USHIPS9-T8 I--------I ----I-T--- ---------- ------RF-A ---------- --G--K---- --GL----FF ----V-----
96USSN20-T8  I---V----I A--------A -I-------- ------LTHH Q-E------- --G--Q---- --V-----F- --A-------
AD3.V6       I--------I ------S--- ---------- ------RP-A ---------- ---------- --G---D-F- ----V-----

HXB2         CLFSYHRLRD LLLIVTRIVE LLG..... RRGWEALKYW WNLLQYWSQE LKNSAVSLLN ATAIAVAEGT DRVIEVVQGA
92UG046-T8   -----RH--- -I--AAK--- F--..... ---*
93UG086-T8   ---------- FI--AA-T-- ---HSSLKGL -L---G---L G---L--G-- --I--I--FD TI--VI-GW- -----IG-RI
92US077-T8   F--------- ----A----- ---..... -----I---- --------I-- ---------- ---------- --I---ARRT
93US143-T8   -I-L------ ---------- ---..... -----V---- ---------- -----IN--- ---------- -----IL-R-
96USHIPS4-T8 ---------- ----LA---- ---..... -----T-R-- ---------- ---------- SI--V----- --------RV
96USHIPS9-T8 ---------- ----AA---- ---..... -----I---- ---------- ---------- V--------- --IL--L-R-
96USSN20-T8  ---------- ----AA-T-- ---HSSLKGL -L--G---L ----S--G-- -----IN--D T------NW- -----IG-RF
AD3.V6       ---------- ----AA---- ---..... -----V---C ---------- ---------- TI-------- -----II-R-

HXB2         CRAIRHIPRR IRQGLERILL
92UG046-T8
93UG086-T8   G---LN---- ----A--A-Q
92US077-T8   F---L----- ------A--
93US143-T8   F---L---T- ------A--
96USHIPS4-T8 ---------- ------A--
96USHIPS9-T8 Y---I----- ------A--
96USSN20-T8  G---LN---- ------A-Q
AD3.V6       ----L----- ----F--A-
```

Figure 6D

92UG046-T8 (SEQ ID NO: 9)

ATGAGAGTGAAGGGGATAGAGAGGAATTATCAGCATTTGTGGGAGAGGAATCAGCACTCGTTGTGGAGATGGGGCATCAT
GCTCCTTGGGATGTTAATGATATGTAAAGGAGAATTGTGGGTCACAGTTTATTATGGGGTACCTGTGTGGAAAGAAGCAA
CCACTACTCTATTTTGTGCATCAGATGCTAAATCATATGAACCAGAGGCACATAATATCTGGGCTACACATGCCTGTGTG
CCAACAGACCCCAACCCACGAGAAATAAAACTGGAAAATGTCACAGAAAACTTTAACATGTGGAAAAATGACATGGTGGA
GCAGATGCATGAGGATGTAATCAGTCTATGGGATCAAAGCCTGAAACCATGTGTAAAATTAACCCCACTCTGTGTCACTT
TACATTGCACTGAATATAAGGCCCCTAATGCCACTATTAATGCCACTGATAGGGACATAGGAATGAAAAACTGCTCTTTC
AATGTAACCACAGAAGTAATAAATAAGAAGAAGCAAGAACATGCACTTTTTTATAAACTTGATGTGGTACAAATGGATGA
TAATAGTACTAATACCAACTATAGATTAATAAATTGTAATACCTCAGTCATTACACAGGCGTGTCCAAAGGTAACCTTTG
AGCCAATTCCCATACATTATTGTGCTCCAGCTGGATTTGCGATTCTAAAGTGTAATGATAAGAAGTTCAATGGGACGGGT
CCATGCAAAAACGTCAGCACAGTGCAGTGTACACATGGGATTAGGCCAGTAGTGTCAACCCAACTGTTGTTGAATGGCAG
TCTAGCAGAAGAAGAGATAATAATTAGATCTGAAAATCTCACAAATAATGCTAAAACCATAATAGTACAGCTTAATGAGT
CTGTACCAATTAATTGCTCAAGGCCCTACGAAAATAAAAGACGACGTACACCTATAGGACTAGGGCAAGCGTACTATACA
ACAAAATTAAAAGGATATATAAGACCAGCACATTGTAATATTAGTGGAGCAGAATGGAATAAAACTTTACAACAGGTAGC
TAAAAAATTAGGAGACCTTTTCAACCAGACAACAATAATTTTTCAACCACACTCGGGAGGGGACCCAGAAATTACAACAC
ACAGCTTTAATTGTGGAGGGGAATTTTTCTACTGCGATACATCAAGACTGTTTAATAGGACTTATAATACATCAGGTAGT
ACAGGGGTAAATAACAGTACAATCAAACTCCCATGCAGAATAAAACAAATTATAAACATGTGGCAGGGAGTAGGAAAAGC
AATGTATGCCCCTCCCATTGAAGGACTAATCAAATGTTCATCAAACATTACAGGACTATTGTTGACAAGAGATGGGGGAA
ATAATACTAGGCAGAATGAAGCCTTCAGGCCTGGAGGAGGGGATATGAGAGACAATTGGAGAAGTGAATTATACAAATAT
AAAGTAGTAAGAATTGAACCACTAGGTCTAGCACCCACTGAGGCAAAGAGAAGAGTGGTAGAAAGAGAAAAAAGAGCAAT
AGGACTAGGAGCTATGTTCCTTGGGTTCTTGGGAGCAGCAGGAAGCACGATGGGCGCAGCGTCAATGACGCTGACGGTAC
AGGCCAGACAGTTAATGTCTGGTATAGTGCAACAGCAAAACAATTTGCTGAGGGCTATAGAGGCGCAACAGCATCTGTTG
CAACTCACAGTCTGGGGCATTAAACAGCTCCAGGCAAGAATCCTGGCTGTGGAAAGCTACCTAAAGGATCAACAGCTCCT
AGGAATTTGGGGTTGCTCTGGAAGACACATTTGCACCACTGCTGTGCCCTGGAACTCTAGCTGGAGTAATAAATCTCTAA
ACGAGATTTGGGGTAACATGACCTGGATGGAGTGGGAAAAAGAAATTGACAATTACACAGAATTAATATACAGCTTAATT
GAAGAATCGCAAACCCAGCAAGAAAAGAATGAACAAGAACTATTGAAATTAGACCAATGGGCAAGTTTGTGGAATTGGTT
TAGCATAACAAAATGGCTGTGGTATATAAAAATATTCATAATGATAGTAGGAGGCTTGATAGGTTTAAGAATAGTTTTTG
CTGTGCTTTCTGTAGTAAATAGAGTTAGGCAGGGATATTCACCTCTGTCATTTCAGACCCTCCTCCCAGCCCCGAGGGGA
CCCGACAGGCCAGAAGGAATAGAAGAAGAAGGTGGAGAGCAGGGCAGAGGCAGATCCATTCGATGGTGACCGGATTCTC
AGCACTTATCTGGGACGATCTAAGGAACCTGTGCCTCTTCAGCTACCGCCACTTGAGAGACTTAATCTTAATTGCAGCGA
AGATTGTGGAGTTTCTGGGACGCAGGGGGTGAGAAGCCATCAAGTACCTGTGGAACCTCCTGCAATATTGGATTCAGGAA
CTAAAGAATAGTGCTATTAGCTTATTTGATACCACAGCAATAGCAGTAGCTGAGGGGACAGATAGGGTCATAGAGATATT
ACAAAGATTTATTAGAGCTATTCTTCACATACCCAGACGAATAAGACAGGGCTTGGAAAGGGCTTTACTATAA

Fig. 7

93UG086-T8 (SEQ ID NO: 11)

ATGAGAGTGAAGGGGATACAGAGGAACTGTCAAAACTTGTGGAGATGGGGAACTATAATCTTGGGTATGATGATAATTTG
TAGTGCTGCAGAAAAATTGTGGGTTACTGTTTACTATGGGGTACCTGTGTGGAAAGATGCAGAAACCACCTTATTTTGTG
CATCAGATGCGAAAGCATATGATACAGAAGTGCATAATGTCTGGGCCACACATGCCTGTGTACCTACAGACCCCAACCCA
CAAGAAATAAATTTGGAAAATGTGACAGAAAATTTTAACATGTGGAAAAATAACATGGTAGAGCAGATGCATACAGATAT
AATCAGTCTATGGGACCAAAGCCTAAAGCCATGTGTACAGTTAACCCCTCTCTGTGTTACTTTAGATTGTACTGATGCCA
CAAATGCCACTAATACCACTATCATTAGTGACATGAAAGGAGAAATAAAAAACTGCTCTTTCAATATGACCACAGAATTA
AAGGATAAGACACAGAAAGTACGTTCATTTTTCTATAAGATGGATATAGTACAAATTAACAACAACAACAGCAACAGCAA
CAGTAGTCAGTATAGATTAATAAGTTGTAATACCTCAACCATTACACAAGCTTGTCCAAAGGTATCCTTTGAGCCAATTC
CCATACATTATTGTGCTCCAGCTGGTTTTGCGATTCTAAAATGCAAGGATAAGGAGTTCAATGGAACAGGGCCATGCAGG
AATGTCAGCACAGTACAATGCACACATGGAATCAAGCCAGTAGTATCAACTCAACTACTGTTAAATGGCAGTCTAGCAGA
AGAAAAGGTAATGATTAGATCTGAAAATATCACAGACAATACTAAAAACATAATAGTGCAACTTACTGAGCCTGTAAAAA
TTAATTGTACCAGACCTAACAACAATACAAGAAGAGGTATAAGTATAGGGCCAGGACGAGCATTCATTGCAAGAGATAGA
ATAATAGGGGATATAAGACAAGCACATTGTAACATCAGTAGAGCAGCATGGAATAACACTTTGCAGAAGGTAGCCCAACA
ATTAAGAACACACTTTGAGAACAGAACAATAATCTTTAATCACTCCGCAGGAGGGGACCCAGAAATAACTACACATAGTT
TTAATTGTGGAGGAGAATTTTTCTATTGTAGCACAACAGGCCTGTTTAATAGTACTTGGAATAGCAATGCCAGCACGCAG
GGGTCAAATAGCACGGGTTCAAACGACACTATAACTCTCCAATGCAGAATAAGGCAGATTATAAGGATGTGGCAGAGAGT
AGGACAAGCAATGTATGCCCCTCCCATCCCAGGGGTAATAAGATGTGACTCAAACATTACAGGACTAATATTAACAAGAG
ATGGGGGGGATAATAACAGCACAAATGAGACCTTCAGACCTGGAGGAGGAGATATGAGGGACAATTGGAGAAGTGAATTA
TATAAGTATAAAGTAGTAAAGATTGAACCACTAGGAGTAGCACCCACCAGGGCAAAGAGAAGAGTGGTGGAAAGAGAAAA
AAGAGCAATAGCAGGAATAGGAGCTGTGTTCCTTGGGTTCTTGGGAGCAGCAGGAAGCACAATGGGCGCAGCGTCACTGA
CGCTGACGGTACAGACCAGACAGCTATTGTCTGGCATAGTGCAACAGCAAAGCAATTTGCTGAGGGCTATAGAGGCTCAA
CAGCATCTGTTGAAACTCACGGTCTGGGGCATTAAACAGCTCCAGGCACGAGTCCTGGCTGTGGAGAGATACCTAAAGGA
TCAACAGCTCCTAGGAATTTGGGGTTGCTCTGGAAAACTCATTTGCACCACTACTGTGCCCTGGAACTCTAGTTGGAGTA
ATAAATCCTATAGTGAGATATGGGACAACATGACCTGGCTGCAATGGGATAAAGAAATTAGCAATTATACACAAATAATA
TATGATCTAATTGAAGAATCACAGAACCAGCAGGAAAAGAATGAACAAGACCTATTGGCATTGGACAAGTGGGCAAATCT
ATGGAATTGGTTTGACATATCAAAATGGCTGTGGTATATAAGAATATTTATAATGATAGTAGGAGGCTTAATAGGATTAA
GAATAGTTTTTGCTGTAATTTCAGTAATAAATAGAGTTAGGCAGGGATACTCACCTTTGTCGTTCCAGACCCTTGCCCCG
AACCCAGGGGGTCTCGACAGGCCCGGAAGAATCGAAGAAGAAGGTGGAGAGCAAGACAGAAGCAGATCGATTCGCTTAGT
CAGCGGGTTCTTAGCACTTGCCTGGGAGGACCTGCGGAGCCTGTGCCTCTTCAGCTACCACCGCTTGAGAGACTTCATCT
TGATTGCCGCGAGGACTGTGGAACTTCTGGGACACAGCAGTCTCAAGGGGTTGAGACTGGGGTGGGAAGGACTCAAGTAT
CTGGGGAATCTCCTGTTGTATTGGGGTCAGGAACTAAAAATTAGTGCTATTAGTTTGTTTGATACCATAGCAATAGTAAT
AGCTGGCTGGACAGATAGGGTCATAGAAATAGGACAAAGAATTGGTAGAGCTATTCTCAACATACCTAGAAGAATCAGGC
AGGGCGCCGAAAGGGCTTTACAATAA

Fig. 8

92US077-T8 (SEQ ID NO: 13)

ATGAGAGTGAAGGGGATCAGGAAGAATTATCAGCACTTGTGGAGATGGAGTACCATGCTGCTCCTTGGGATGTTAATGAT
TTGTAGTGCTACAGAACAATTGTGGGTCACAGTCTATTATGGGGTACCTGTGTGGAAAGAAGCAAACACCACTCTATTTT
GTGCATCAGATGCTAAAGCATATGATACAGAGGCACATAATGTTTGGGCCACACATGCCTGTGTACCCACAGACCCCAAC
CCACAAGAAATAGTATTGGCAAATGTGACAGAAGATTTTAACATGTGGAAAAATAACATGGTAGAACAGATGCATGAGGA
TATAATCAGTTTATGGGATCAAAGCCTAAAGCCATGTGTAAAATTAACCCCACTCTGTGTTACTTTAAATTGCACTGATG
TAAGGAATGGTACTATTGTGAGGAATAGTACTATTAGGGTCGAGGAAGGGATGAAGGAAGAAATAAAAAACTGCTCTTTC
AATGTCACCACAAGCATGAGAGACAAGTTGCAGAAAGAAGATGCATTTTTTTATAAATCTGATGTAATACCAATAGGTAA
TGATAATAATACTAATACCAGCAATAATAATATCACCTATACCAGCTATAGGTTGAGAAGTTGTAATACCTCAGTCATTA
CACAGGCCTGTCCAAAGATAAACTTTGAGCCAATTCCCATACATTATTGTGCCCCGGCTGGGTTTGCGATTCTGAAGTGT
AATAATAGGACGTTCGAGGGAAAAGGACCATGTAAAAATGTCAGCACAGTACAATGTACACATGGAATTAGGCCAGTAGT
ATCAACTCAACTGCTGTTAAATGGCAGTCTAGCAGAAAAAGATATAGTAATTAGATCTGCCAATTTCTCAGACAATGCTA
AAGCCATAATAGTACAGCTGAACGAAACTGTACAAATCAATTGTACAAGACCCAACAACAATACAAGAAGAAGAATAACT
ATGGGACCAGGAAGAGTATATTATACAACAGGAGACATAATAGGAGACATAAGACGAGCACATTGTAACATTAGTAAGGA
AGATTGGAATAACACTCTAAAACAGATAGCTAAAAAATTAAGAGAACAATTTGGGGATAATAAAACAATAGCCTTTAAGC
CATCCTCAGGAGGGGACCCAGAAATTGTAATGCACAGTTTTAATTGTGGAGGGGAATTTTTCTACTGTAATACAACAAAA
CTGTTTAATAGTACTTGGGATGGTAATAGTACTCGGAATAATACTGAAGGGTCAAGTAACAATGGAAATATCACACTTCA
ATGCAGAATAAAACAAATTATAAACATGTGGCAGGGAGTAGGAAAAGCAATGTATGCCCCTCCCATCAGAGGACAAATTA
GATGTTCATCAAACATTACAGGGCTGCTATTAACAAGAGATGGTGGTAATACCAACGATACTAACAATACTGAGATCTTC
AGACCTGGAGGAGGAGATATGAGGGACAATTGGAGAAGTGAATTATATAAATATAAAGTAGTAAAAATTGAACCATTAGG
AATAGCACCCACCAAGGCAAAGAGAAGAGTGGTGCAAAGAGAAAAAAGAGCAATGGGAATAGGAGCTCTGTTCCTTGGGT
TCTTGGGAGCAGCAGGAAGCACTATGGGCGCAGCGTCAATGACGCTGACGGTACAGGCCAGACAACTATTGTCTGGTATA
GTGCAACAGCAGAACAATTTGCTGAGGGCTATTGAGGCGCAACACCATCTGTTGCAACTCACAGTCTGGGGCATCAAGCA
GCTCCAGGCAAGAGTCCTGGCTGTGGAAAGATACCTAAAGGATCAACAGCTCCTGGGGATTTGGGGTTGCTCTGGAAAAC
TCATTTGCACCACTGCTGTGCCTTGGAATGCTAGTTGGAGTAATAAATCTCTGGATAAGATTTGGAATAACATGACCTGG
ATGCAGTGGGAAAGAGAAATTGACAATTACACAAGTCTAATATACACTTTAATTGAAGAATCGCAGAACCAACAAGAAAA
GAATGAACTAGAGTTACTAGAATTAGATAAATGGGCAAATTTGTGGAATTGGTTTGACATAACAAAATGGCTGTGGTATA
TAAAAATATTCATAATGATAGTAGGAGGCTTGATAGGTTTAAGAATAGTTTTTGTTATACTTTCTATAGTGAATAGAGTT
AGGCAGGGATACTCACCATTATCGTTTCAGACCCGCCTCCCAGCCCAGAGGGGACCCGACAGGCCCGAAGGAATCGAAGA
AGAAGGTGGAGGGAGAGGCAGAGACACATCCGGGCCATTAGTGGATGGATTCTTAGCAATTATCTGGGTCGACCTGCGGA
GCCTGTTCCTCTTCAGCTACCACCGCTTGAGAGACTTACTCTTGATTGTAGCGAGGATTGTGGAACTTCTGGGACGCAGG
GGGTGGGAAATCCTCAAGTATTGGTGGAATCTCCTACAGTATTGGATTCAGGAACTAAAGAATAGTGCTGTTAGCTTGCT
CAACGCCACAGCCATAGCAGTAGCTGAGGGGACAGATAGGATTATAGAAGTAGCAAGAAGGACTTTTAGAGCTATTCTCC
ACATACCTAGAAGAATAAGACAGGGCTTGGAAAGGGCTTTGCTATAA

Fig. 9

93US143-T8 (SEQ ID NO: 15)

atgagagtgaaggggatcatgaaGAATTATCAGCACTTTTGGAGATGGGGCACCATGCTCCTGGGGTTATTGATGATCTG
TAGTGCTGCAGATCAATTGTGGGTCACAGTCTATTATGGAGTACCTGTGTGGAAGGAAACAACCACCACTCTATTTTGTG
CATCAGATGCTAAAGCATATGATAAAGAGGTACATAATGTTTGGGCCACACATGCCTGTGTACCCACAGACCCCAACCCA
CAAGAAATACCATTGGTAAATGTAACAGAAAATTTTAACATGTGGAAAAATAACATGGTAGATCAAATGCATGAGGATAT
AATCAGTTTATGGGATCAAAGCCTAAAGCCATGTGTAAAATTAACCCCACTCTGTGTTACTTTAAATTGCACTGATGATT
TGAGGAATGCTACTAATACCACTACTAATACCAATAGTAATTGGGAGAAACCAATGGAGAAAGGAGAAATAAAAAACTGC
TCTTTCAAAATCACCTCAAGCATAAGAGATAAGGTACAGAAACAATATGCACTTTTTTATAGCCTTGATGTAGTACCAAT
AAAGAATAACAATAATATTAGCAATAAGATTAGATATAGGTTAAGAAGTTGTAACACCTCAGTCATTACACAGGCCTGTC
CAAAGGTAACCTTTGAGCCAATTCCCATACATTATTGTGCCCCGGCTGGTTTTGCGATTCTAAAATGTAATGATAAGAAG
TTCAATGGAACAGGACCATGTACAAATGTCAGCACAGTACAATGTACTCATGGAATTAGGCCAGTAGTATCAACTCAACT
ACTGTTAAATGGCAGTCTAGCAGAAGAAGAGGTAGTAATTAGATCTGAAAATTTCACAGACAATGCTAAAACCATAATAG
TACAACTGAAAGACCCTGTAGAAATCAATTGTACAAGACCCAACAGAAATGCATGGAAAGGCATACCTATTGGAGTACCA
GGGAGAAAATTCTATGCAAGAAGAAACATAACAGGAGATATAAGACAAGCATATTGTAACCTTAGTATAGCAAAGTGGAA
TAACACTTTAAAACAGATAGTTGAAAAATTAAGATTACATTTTAAAAATAAAACAATAGTCTTTAATAGTTCCTCAGGGG
GGGACCCAGAAATTATACTGCACAGTTTTAATTGTGGAGGGGAATTTTTCTATTGTAATTCAACAAAACTGTTTAATAGT
ACTTGGAATAGTACTACTGAAGGGTTAAATAACACTGGAGAAGACCCAATCGTACTCCCATGCAGAATAAAGCAAATTAT
AAACATGTGGCAGGAAGTAGGAAAAGCAATGTATGCCCCTCCCATCGCAGACCTAATTAGATGCTCATCAAATATTACAG
GGCTGCTATTAACAAGAGATGGTGGTGTTGATGAGAACAGCAACACCACCGAGACCTTCAGGCCTGGAGGAGGAAATATG
AGGGACAATTGGAGAAGTGAATTATATAAATATAAAGCAGTAAAAATTGAACCCTTAGGGGTAGCACCCACCAAGGCAAA
GAGAAGAGTGGTGCAGAGAGAAAAAAGAGCAGTGGGAATAGGAGCTGTGTTCCTTGGGTTCTTGGGAGCAGCAGGAAGCA
CTATGGGCGCAGCATCAATAACGCTGACGGTACAGGCCAGACAATTATTGTCTGGTATAGTGCAACAGCAGAACAATTTG
CTGAGGGCTATTGAGGCGCAACAGCATCTGTTGCAACTCACAGTCTGGGGCATCAAGCAGCTCCAGGCGAGAGTCCTGGC
TGTGGAAAGATACCTAAAGGATCAACAGCTCCTGGGATTTTGGGGTTGCTCTGGAAAACTCATCTGCACCACTGCTGTGC
CTTGGAATGCTAGTTGGAGTAATAAATCTCTGGATAGGATTTGGAATAATATGACCTGGATGGAGTGGGAAAGAGAAATT
GACAATTACACAGGCTTAATATACAACTTAATTGAAGAATCGCAAAACCAACAAGAAAAGAATGAACAAGAATTATTAGC
ATTAGATAAATGGGCAAGTTTGTGGAATTGGTTTGACATAACAAACTGGCTGTGGTATATAAAAATATTCATAATGATAG
TAGGAGGCTTGATAGGTTTAAGAATAGTTTTTACTGTACTTTCTATAGTGAATAGAGTTAGGCAGGGATACTCACCATTA
TCGTTTCAGACCCACCACCCAGCTCAGAGGGAACCCGACAGGCCCGAAGGAATCGAAGGAGAAGGTGGAGAGAGAGACAG
AGACAGATCCGGTCCCTTAGTGGATGGATTCTTAGCAATTATCTGGGTCGACCTGCGGAGCCTGTGCATCTTCCTCTACC
ACCGCTTGAGAGACTTACTCTTGATTGTAACGAGGATTGTGGAACTTCTGGGACGCAGGGGGTGGGAAGTCCTCAAATAT
TGGTGGAATCTCCTACAGTATTGGAGTCAGGAACTAAAGAATAGTGCTATTAACTTGCTCAACGCCACAGCCATAGCAGT
AGCTGAGGGGACAGATAGGGTTATAGAAATATTACAAAGAGCTTTTAGAGCTATTCTCCACATACCTACAAGAATAAGAC
AGGGCTTGGAAAGGGCTTTGCTATAA

Fig. 10

96USSHIPS4-T8 (SEQ ID NO: 17)

ATGAGAGTGAAGGGGATCAGGAACAATTGGCAGCACTTATGGAGATGGGGCACCATGCTCCTTGGGATGTTGATGATCTG
TAGTGCTACAGAACAATTGTGGGTCACAGTCTATTATGGGGTTCCTGTGTGGAGAGAAGCAACAACCACTCTATTCTGTG
CATCAGATTCTAAAGCATATGATACAGAGGCACATAATGTTTGGGCCACACATGCCTGTGTACCCACAGACCCCAACCCA
CAAGAAGTATTATTGGAAAATGTGACAGAAAATTTTAACATGTGGAAAAATGACATGGTAGAACAGATGCATGAGGATAT
AATCAGTCTATGGGATCAAAGCCTAAAGCCATGTGTAAAACTAACCCCACGTTGTGTTACTTTAAAGTGCACTGATTATG
AGGGAAATGCTAATAATACCATTGATAATGCCACTAAAAATAGCTGGAAAGGAGAAATAAAAAATTGCACTTTCAATGTC
ACCACAGCCATAAGAGATAAGGTGAAGAAACAATATGCACTTTTTCATAGTCTTGATGTAGTCCCAATAAAAGATGCTAA
GGATAGTAACAGCTATAGGTTGATAAGTTGTAACACCTCAGTCATTACACAGGCTTGTCCAAAGACATCCTTTGAGCCAA
TTCCCATATATTATTGTGCCCCGGCTGGGTTTGCGATTCTAAAATGTAACAATAAGACATTCAGTGGAAAAGGACAATGT
AAAAATGTCAGCACAGTACAATGTACACATGGAATTAGGCCAGTAGCATCAACTCAACTGCTGTTAAATGGCAGTCTAGC
AGAAGAAGAGATAATAATTAGATCTGACAATTTCACAAACAATGCTAAAATCATAATAGTACAGCTGAAAGAACCTGTAG
AAATTAATTGTACAAGGCCCGGCAACAATACAAGAAAAAGTATACATATAGGACCAGGGAGAGCATGGTATGCAACAGGA
GATATAATAGGAGATATAAGACAAGCACATTGCAACCTTAGTAGTGTAAAATGGAATAACACTTTAAGACAGATAGCTAA
AAAATTAGGAGAACAATTTCAGGATAAAAATATAACCTTTAAGCAATCCTCAGGAGGGGACCCAGAAATTGTAATGCACA
GTTTTAATTGTGGGGGGGAATTTTTCTACTGTAATGCAACACAACTGTTTAATAGTACCTGGGATAATGGTACTTGGAAT
AACAGTACTTGGAATGAAACTGATACTACCACTATCACACTCCCATGCAGGATAAAACAAATTGTAAACATGTGGCAGAC
AGTAGGAAGAGCAATGTATGCCCCTCCCATTAGAGGAGAAATTAGTTGTTCATCAAATATTACAGGGCTGCTATTAACAA
GAGATGGTGGTAATATAAATGAGACAAATGGGACTGAGATCTTTAGACCTGCAGGAGGAGATATGAGGGACAATTGGAGA
AGTGAATTATATAAATATAAAGTAGTAAAAATTGAACCATTAGGAATAGCACCCACCAAGGCAAAGAGAAGAGTGGTGCA
GAGAGAAAAAAGAGCAGTGGGAGTAGGAGCTATGTTCCTTGGGTTCTTGTCAGCAGCAGGAAGCACTATGGGCGCAGCGT
CAGTGACGCTGACGGTACAGGCCAGACAATTATTGTCTGGTATAGTGCAACAGCAGAACAATTTGCTGAGGGCTATTGAG
GCGCAACATCATCTGTTGCAACTCACAGTCTGGGGCATCAAGCAGCTCCAGGCAAGAGTCCTGGCTGTGGAAAGATACCT
AGGGGATCAACAGCTCCTGGGGATTTGGGGTTGCTCTGGAAAACTCATCTGCACCACTACTGTGCCTTGGAATACTAGTT
GGAGTAATAAATCACTGAAATACATTTGGGATAACATGACCTGGATGCAGTGGGATAAAGAAATTAGCAATTACACAGGC
TTAATATACACCTTAATTGAGGAATCGCAGAACCAGCAAGAAAAGAATGAAAAGGAACTACTGGAATTGGATAAATGGGC
AAGTTTGTGGAATTGGTTTGACATAACAAACTGGCTGTGGTATATAAAAATATTCATAATAATAGTAGGAGGCTTGATAG
GTTTAAGAATAGTTTTTACTGTACTTTCTATAGTGAATAGAGTTAGGCAGGGATACTCACCACTATCGTTTCAGACCCGC
CTCCCAACCCAGAGGGGACCCGACAGGCCCGAAGGAATCGAAGAAGAAGGTGGAGAGAGAGACAGAGACAGATCAAGAAC
ATCAGTGGATGGATTCTTAGCACTTATCTGGGTCGATCTACGGAGCCTGTGCCTCTTCAGCTACCACCGCTTGAGAGACT
TACTCTTGATTCTAGCGAGGATTGTGGAACTTCTGGGACGCCGGGGGTGGGAAACCCTCAGATATTGGTGGAATCTCCTA
CAGTATTGGAGTCAGGAACTAAAGAATAGTGCTGTTAGCTTGCTTAATTCTATAGCCATAGTAGTAGCTGAGGGAACAGA
TAGGGTTATAGAAGTAGTACAGAGAGTTTGTAGAGCTATCCGCCACATACCTAGAAGAATAAGACAGGGCTTGGAAAGGG
CTTTGCTATAA

Fig. 11

96USHIPS9-T8 (SEQ IS NO: 19)

atgagagTgaaggagatcatgaaaaattatcagcACTGGTGGAGAGGGGGCATCATGCTCCTTGGGTTGTTAATGATCTG
TAGTGCTGCTGAACAATTGTGGGTCACAGTCTATTATGGGGTACCCGTGTGGAAAGAAGCAACCACCACTCTATTCTGTG
CATCTGATGCTAAAGCATATGATACAGAGAAACATAATGTTTGGGCCACACATGCCTGTGTACCTACAGACCCCAACCCA
CAAGAAGTAGTATTGGAAAATGTGACAGAAAATTTTAACATGTGGAAAAATAACATGGTAGAACAGATGCATGAGGATAT
AATCAGTTTATGGGATCAAAGTCTAAAGCCATGTGTAAAACTAACCCCACTCTGTGTCACTTTAAACTGTAGGAACGTTA
CTATTACCAATACTACTACCAATAGTAGTGGCTGGAAACTAATGGAGGAAGGAGAAATAAAAAACTGCTCTTTCAAAATC
ACCACAATACTGAGACATAAGATGCAGGAAGAACATGCACTTTTTTATAAATCAGATGTAGTACCACTAGGTAATAATAG
TGCAATAGGTAATAATAATGCCAGATATAGGTTGATAAGTTGTAACACCTCAACCATTACACAGGCCTGTCCAAAGGTAT
CCTTTGAGCCAATTCCCATACATTATTGTGCCCCGGCTGGTTTTGCGATTCTAAAATGTAGAGATAAGAAGTTCAATGGA
ACAGGACCATGTAAAGATGTCAGCACAGTACAATGTACACATGGAATTAAGCCAGTAGTATCAACTCAACTACTGTTAAA
TGGCAGTCTAGCAGAAGAAGATATAGTAATTAGATCTGCCAATTTCTCAGACAATGCTAAAATCATAATAGTACAGCTGA
ATAAAACTGTAGTAATTAATTGTACAAGACCCAACAATAATACAAGAAAAGGTATAAATATAGGACCAGGAAGAACAGTT
TATGCAACAGGAAAAATAATAGGAGATATAAGACAAGCACATTGTAACATTAGTAAAGGAGAATGGTATAACACTTTAAA
GCAGGTAGTTACAAAATTAGGAGAACATTTTAAGAATAAAACAATAGCCTTTAATAAATCCTCAGGAGGGGACCCAGAAA
TTGTAAAGCACACTTTTAATTGTGGAGGGGAATTTTTCTACTGTGATTCAACAAAATTGTTTACTAGTACTTGGAACTAT
ACTAATGGTACTTGGAATAGTACTAACTGGAATGATACTGAAATGTTGAATAAAACAATCACACTCCCATGCAGAATAAA
ACAAATTGTAAACATGTGGCAGGAAGTAGGGAAAGCAATGTATGCCCCTCCCATCAGCGGACTTATTACATGTTCATCAA
ATATTACAGGACTACTATTAACAAGAGATGGTGGTAGTAACACGAACACCACCGAGGTCTTCAGACCTGGAGGAGGAAAT
ATGAAGGACAATTGGAGAAGTGAATTATATAAATATAAAGTAGTAAAAATTGAACCATTAGGAGTAGCACCCACCAAGGC
AAAAAGAAGAGTGGTGCAGAGAGAAAAAAGAGCAGTGGGAATAGGAGCTCTGTTCCTTGGGTTCTTGGGAGCAGCAGGAA
GCACTATGGGCGCAGCGTCACTGACGCTGACGGTACAGACCAGACAATTATTGTCTGGTATAGTGCAGCAGCAGAACAAT
CTGCTGAGGGCTATTGAGGCGCAACAGCATCTGTTGCAACTCACAGTCTGGGGCATCAAGCAGCTCCAGGCAAGAGTCCT
GGCTGTGGAAAGATACCTAAAGGATCAACAGCTCCTGGGGATTTGGGGTTGCTCTGGAAAACTCATTTGCACCACTACTG
TGCCTTGGAATGCTAGTTGGAGTAATAAATCTCTGGATGATATTTGGCAGAACATGACCTGGATGGAGTGGGAAAGAGAA
ATTGACAATTACACAAATGTAATATACAATTTAATTGAAGAATCGCAGAACCAGCAAGAAAAGAATGAACAAGACTTATT
AGCATTGGATAAATGGGCAAGTTTGTGGGATTGGTTTAGCATATCAAACTGGCTGTGGTATATAAAAATATTCATAATGA
TAGTAGGAGGCTTGATAGGTTTAAGAATAATTTTTACTGTACTTTCTATAGTGAATAGAGTTAGGCAGGGATACTCACCA
TTATCGTTTCAGACCCGCTTCCCAGCCCCGAGGGGACCCGACAGGCCCGAAGGAATCGAAGAAGGAGGTGGAGAGAAAGA
CAGAGACAGATCCGGGCTATTAGTGAACGGATTCTTTGCACTTATCTGGGTGGACCTACGGAGCCTGTGCCTCTTCAGCT
ACCACCGCTTGAGAGACTTACTCTTGATTGCAGCGAGAATTGTGGAGCTTCTGGGACGCAGGGGGTGGGAAATCCTCAAG
TATTGGTGGAATCTCCTGCAGTATTGGAGTCAGGAACTAAAGAATAGTGCTGTTAGCTTGCTTAATGTCACAGCCATAGC
AGTAGCTGAGGGGACAGATAGGATTCTAGAAGTATTACAAAGAGCTTATAGAGCTATTATTCACATACCTAGAAGAATAA
GACAGGGCTTAGAAAGGGCTTTGCTATAA

Fig. 12

patent application

96USSN20 (SEQ ID NO: 21)

ATGAGAGTGAAGGGGACACAGAAGAGTTATCCACTCTTATGGAGGTGGGGTATAATATTTTGGATAATGGTAATTTGTAA
TGCTGAAAATTTGTGGGTCACGGTCTATTATGGGGTACCTGTGTGGAGAGACGCAGAGACCACCTTATTTTGTGCATCAG
ATGCTAAAGCATATGATACAGAAGTACATAATGTTTGGGCTACACATGCCTGTGTACCCACAGACCCTAACCCACAAGAA
ATACCTTTGGAAAATGTAACAGAAAATTTTAATATGTGGAAAAATAACATGGTAGAGCAGATGCATGAAGATATAATTGA
TCTATGGGACCAAAGCCTAAAGCCATGTGTAAAGTTAACCCCTCTCTGTGTTACTTTAAATTGCCATAACTTCAATAACT
TCAATAGCAGCAATAACAGCACCCCTATCAACAACACCATATATAATGGCATGCAAGGGGAAATAAAAAATTGCTCTTTC
AATACAACCACAGAATTAAGAGGTAAGACAAAGAAACAGTATGCACTTTTTAATAAACTTGATGTAGTACAAATTAATGA
TAAGAATAATAGTCATAGTAATAATAGACGGTATATGTTAATACATTGTAATACCTCAACCATTACACAGGCTTGTCCAA
AGGTAACCTTTGAGCCAATTCCCATACATTATTGTGCCCCAGCTGGTTTTGCAATTCTAAAATGTAAGGATCAGGAGTTC
AATGGATCAGGACCATGCAACAATGTCAGCACAGTACAATGCACACATGGAATCAAGCCAGTAGTATCAACTCAGCTGCT
GTTAAATGGCAGTCTAGCAGAAAGAAAAATAATGATTAGATCTGAAAATATCACAAACAATGCCAAGACCATAATAGTAC
AGTTCACTGAGCCTGTAGAAATTAATTGTACCAGACCTAACAACAATACAAGAAAAAGGGTAGGTGTAGGACCAGGGCGA
GCAGTCTATGTAACAAATGCCATAATAGGGGATATAAGACAAGCACATTGTAATGTCAGCAGAGCAAAATGGAATGACAC
TTTAAAGAAGGTAGTTACACAATTAAGGAAGCACTTTAACACAACAATAGTCTTTACTAAACCCTCAGGAGGGGATGTGG
AAATTACAACACATAGTTTTAACTGTGGAGGAGAATTTTTCTATTGCAATACATCACAACTGTTTAATAGCACTTGGTAT
ATCAATGGCACAAACCACACAGGGCCATATGACACTGACACTATAACTCTCCGATGCAGAATAAAGCAAATTGTAAAAAC
ATGGCAGAGAGTAGGACAAGCAATGTATGCTCCTCCCATCCCAGGAGTAATAAGGTGTGACTCAAACATTACAGGAATAT
TATTAACAAGAGATGGAGGGAAAATTAATAGTACAAATGAGACTTTCAGGCCTGGAGGAGGAGATATGAGGGACAATTGG
AGAAGTGAATTATATAAGTATAAAGTAGTAAAAATTGAACCACTAGGTGTAGCACCCACCCATGCAAAAAGAAGAGTGGT
GGAGAGAGAAAAAAGAGCAGTTGGAGTAATAGGAGCTGTCTTCCTTGGGTTCTTAGGAGCAGCAGGAAGCACTATGGGCG
CAGCGGCAATAACGCTGACGGTACAGGCCAGACAATTATTGTCTGGTATAGTGCAACAGCAGAGCAATCTGCTGAGGGCT
ATAGAGGCTCAACAGCATCTGTTGAAACTCACGGTCTGGGGCATTAAACAGCTCCAGGCAAGAGTCCTGGCTCTGGAAAG
ATACCTAAGGGATCAACAGCTCCTAGGAATTTGGGGCTGCTCTGGAAAGCTCATCTGCACCACTAATGTACCCTGGAATT
CTAGTTGGAGTAATAAAACTTTTAATGACATATGGAATAACATGACCTGGTTACAATGGGATAAAGAAATTAACAATTAC
ACAAACACAATATATCGTCTAATTGAAGAATCGCAGAACCAGCAGGAAAAGAATGAACAAGATTTATTGGCATTGGACAA
GTGGGCAAGTCTGTGGAGTTGGTTTGACCTATCAAATTGGCTATGGTATATAAGAATATTTATAATGGTAGTAGGAGGTT
TGATAGCTTTAAGAATAGTTTTTGCTGTGCTTGCTATAATAAATAGAGTTAGGCAGGGATACTCACCTCTATCATTCCAG
ACCCTTACCCACCACCAGAGGGAACCCGACAGGCCCGAAGGAATCGAAGAAGGAGGTGGCGAGCAAGACAGAGACAGGTC
CGTGAGATTAGTGAACGGATTCTTAGCTCTTGCCTGGGACGATCTACGGAGCCTGTGCCTCTTCAGCTACCACCGATTGA
GAGACTTACTCTTGATTGCAGCGAGGACTGTGGAACTTCTGGGACACAGCAGTCTCAAGGGACTGAGACTGGGGTGGGGA
GCCCTCAAATATCTGTGGAATCTTCTGTCATACTGGGGCCAGGAACTAAAGAATAGTGCTATTAATCTGCTTGATACAAC
AGCAATAGCAGTAGCTAATTGGACAGACAGAGTTATAGAAATAGGACAAAGATTTGGTAGAGCTATTCTCAATATACCTA
GAAGAATCAGACAGGGCCTCGAAAGGGCTTTGCAATAA

Fig. 13